

IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) An optical information recording/reproducing apparatus including comprising:

an optical pickup means for making a light beam emitted from a light source incident on a recording medium via a two-group objective lens so as to record or reproduce optical information on or from said recording medium, said two-group objective lens including a first lens disposed ~~in the vicinity of~~ at a first position facing said recording medium and a second lens disposed ~~at a preset distance from the first position also facing to~~ at a second position further from the recording medium than with said first position lens, said first and second lenses having a common optical axis put therebetween[[:]] ~~said apparatus comprising[[:]]~~;

a reproducing signal detecting means for providing reproducing signals from light received from the recording medium after passage through the pickup means;

a moving means for ~~eyelieally~~ repeatedly moving at least one of said first lens and said second lens ~~constituting part of said optical pickup in a direction of an~~ back and forth between two end positions along the common optical axis thereof respectively nearer to and farther from the record medium, with each movement between the two end positions occurring over corresponding equal periods of time; and

a control means for performing, upon a focusing operation after start up of focus control, ~~the~~ a positional adjustment of said at least one of said first lens and said second lens to adjust the distance there between ~~after start up of focus control~~[[,]] on the basis of changes in the reproducing signals obtained ~~from said recording medium~~ at one or more ~~points of the cyclic movement~~ positions of said at least one of said first lens and said second lens during the repeated movement thereof by said moving means [[,]] ~~wherein the cyclic change in a distance between said first lens and said second lens is longer than a cycle of the cyclic movement of said at least one of said first lens and said second lens.~~

2. (Currently Amended) An optical information recording/reproducing apparatus according to claim 1, ~~wherein a cycle of the cyclic~~ further comprising means for synchronizing the repeated movement of said at least one of said first lens and said second lens by said moving means ~~is synchronized with an appearance cycle of pit signal portions which are previously~~[[,]] in the reproducing signal caused by pits discretely formed on said recording medium.

3. (Currently Amended) An optical information recording/reproducing apparatus according to claim 1, wherein the ~~positional adjustment of said at least one of said first lens and said second lens is based on~~ changes in the reproducing signals are changes in an envelope component ~~of the reproducing signal~~ thereof.

Claim 4 (Canceled).

5. (Currently Amended) An optical information recording/reproducing apparatus according to claim 1, wherein said ~~control means performs, upon focusing operation, the positional adjustment of said first lens and said second lens after start-up of focus control, on the basis of reproducing signals from said recording medium at both ends of the cyclic movement of said at least one of said first lens and said second lens by said moving means~~ one or more positions are two positions corresponding to said two end positions.

6. (Currently Amended) An optical information recording/reproducing apparatus according to claim [[1]] 3, wherein further comprising a low band filter receiving the reproducing signals and providing the envelope component is a signal component of the reproducing signals detected by the optical pickup passed through a low band filter to the control means.

7. (Currently Amended) An optical information recording/reproducing apparatus according to claim [[1]] 3, wherein further comprising a high band filter receiving the reproducing signals and providing the envelope component is a signal component of the reproducing signals detected by the optical pickup passed through a high band filter to the control means.

8. (Original) An optical information recording/reproducing apparatus including an optical pickup for making a light beam emitted from a light source incident on a recording medium via a two-group objective lens and at least a third lens so as to record or reproduce

optical information on or from said recording medium, said two-group objective lens including a first lens disposed in the vicinity of said recording medium and a second lens disposed at a position facing to said recording medium with said first lens put therebetween and being configured such that a distance between said first lens and said second lens is fixed, said apparatus comprising:

a first drive means for integrally driving said first lens and said second lens in the direction of the optical axis thereof, and a second drive means for driving said third lens in the direction of the optical axis thereof;

a moving means for cyclically moving at least one of said first and second lenses and said third lens constituting part of said optical pickup in the direction of the optical axis thereof; and

a control means for performing, upon focusing operation, the positional adjustment of said first and second lenses and said third lens after start-up of focus control, on the basis of reproducing signals obtained from said recording medium at one or more points of the cyclic movement of said at least one of said first and second lenses and said third lens by said moving means.

9. (Original) An optical information recording/reproducing apparatus according to claim 8, wherein a cycle of the cyclic movement of said at least one of said first and second lenses and said third lens by said moving means is synchronized with an appearance cycle of pit signal portions which are previously, discretely formed on said recording medium.

10. (Original) An optical information recording/reproducing apparatus according to claim 8, wherein the positional adjustment of said first and second lenses and said third lens is based on an envelope component of a reproducing signal detected by said optical pickup.

11. (Original) An optical information recording/reproducing apparatus according to claim 8, wherein a cycle of the cyclic movement of said third lens is longer than a cycle of the cyclic movement of said first and second lenses.

12. (Original) An optical information recording/reproducing apparatus according to claim 8, wherein said control means performs, upon focusing operation, the positional adjustment of said first and second lenses after start-up of focus control, on the basis of reproducing signals obtained from said recording medium at both ends of the cyclic movement of said first and second lenses by said moving means.

13. (Currently Amended) An optical information recording/reproducing apparatus according to claim 8, wherein of an envelope component of a reproducing signal detected by said optical pickup, a signal component having passed through a low band filter is used for detection of a variation in amplitude accompanied by the movement of said third ~~lense~~ lens.

14. (Original) An optical information recording/reproducing apparatus according to claim 8, wherein of an envelope component of a reproducing signal detected by said optical pickup, a signal component having passed through a high band filter is used for detection of a

variation in amplitude resulting from an offset in focus control.

15. (Amended) An optical information recording/reproducing apparatus ~~including~~
comprising:

an optical pickup ~~for making~~ configured to record or reproduce optical information on
or from a recording medium using a light beam emitted from a light source, the optical pickup
including incident on a recording medium via a primary lens disposed in the vicinity of nearer
to said recording medium and at least than a secondary lens of the optical pickup, the primary
and secondary lenses having a common optical axis; so as to record or reproduce optical
information on or from said recording medium, said apparatus comprising[[:]]

a detector configured to provide reproducing signals from light received from said
recording medium via the optical pickup;

a drive signal source configured to output a primary drive signal of a primary frequency
and a secondary drive signal of a secondary frequency, said secondary frequency being of
higher frequency than said primary frequency;

a first drive ~~means for driving~~ actuator configured to be responsive to the primary drive
signal to repeatedly move said primary lens in opposite directions along a direction of an the
common optical axis thereof between two primary end positions respectively closer to and
further from the recording medium; and

a second drive ~~means for driving~~ actuator configured to be responsive to the secondary
drive signal to repeatedly move said secondary lens in opposite directions along a direction of

an the common optical axis thereof between two opposite secondary end positions respectively
closer to and further from the recording medium; and

~~a moving means for cyclically moving at least one of said primary lens and said~~
~~secondary lens constituting part of said optical pickup in the direction of the optical axis~~
~~thereof[;]] and~~

~~a control means for performing[;]] upon focusing operation[;]] the~~ circuitry
configured to control a positional adjustment of at least one of said primary lens and said
secondary lens position during a focusing operation occurring after start-up of focus control[;]]
on the basis of changes in the reproducing signals obtained ~~from said recording medium~~ at one
or more ~~points of the cyclic movement~~ positions of said at least one of said primary lens and
said secondary lens during the movement thereof along the common optical axis by a
corresponding drive actuator ~~by said moving means[;]] wherein a cycle of the cyclic~~
~~movement of said secondary lens is longer than a cycle of the cyclic movement of said primary~~
~~lens.~~

16. (Currently Amended) An optical information recording/reproducing apparatus
according to claim 15, ~~wherein a cycle of the cyclic~~ further comprising means for
synchronizing the repeated movement of said ~~at least one of said~~ primary lens and said
secondary lens ~~by said moving means is synchronized~~ along the common optical axis by a
corresponding drive actuator with an ~~appearance cycle of pit~~ signal portions ~~which are~~
~~previously[;]]~~ in the reproducing signal caused by pits discretely formed on said recording
medium.

17. (Currently Amended) An optical information recording/reproducing apparatus according to claim 15, wherein the ~~positional adjustment of said primary lens and said secondary lens is based on~~ changes in the reproducing signals are changes in an envelope component of a reproducing signal detected by said optical pickup thereof.

Claim 18 (Canceled).

19. (currently Amended) An optical information recording/reproducing apparatus according to claim 15, wherein said ~~control means performs, upon focusing operation, the positional adjustment of said primary lens and said secondary lens after start-up of focus control, on the basis of reproducing signals from said recording medium at both ends of the cyclic movement of said at least one of said primary lens and said secondary lens by said moving means~~ one or more positions are two positions corresponding to at least one pair of said opposite primary and secondary end positions.

20. (Currently Amended) An optical information recording/reproducing apparatus according to claim ~~[[15]]~~ 17, wherein ~~of an~~ further comprising a low band filter receiving the reproducing signals and providing the envelope component of a reproducing signal detected by the optical pickup, ~~a signal component having passed through a low band filter is used for detection of a variation in amplitude accompanied by of said secondary lens to the control~~ circuitry.

21. (Curently Amended) An optical information recording/reproducing apparatus according to claim ~~[[15]]~~ 17, ~~wherein of an~~ further comprising a high band filter receiving the reproducing signals and providing the envelope component of a reproducing signal detected by said optical pickup, a signal component having passed through a high band filter is used for detection of a variation in amplitude resulting from an offset in focus control to the control circuitry.

22. (Amended) An optical information recording/reproducing method which is carried out by using an optical pickup for making a light beam emitted from a light source incident on a recording medium via a two-group objective lens so as to record or reproduce optical information on or from said recording medium, said two-group objective lens including a first lens disposed ~~in the vicinity of~~ at a first position facing said recording medium and a second lens disposed ~~at a~~ preset distance from the first position also facing ~~to~~ said recording medium at a second position further from the recording medium than ~~with said first position lens, said first and second lenses having a common optical axis put~~ therebetween ~~[[,]]~~ said method comprising the steps of:

receiving light from the recording medium at a reproducing signal detector after light passage through the optical pickup and providing a reproducing signal from the reproducing signal detector;

eyeliactly repeatedly moving at least one of said first lens and said second lens ~~constituting part of said optical pickup in a direction of an~~ back and forth between two end positions along the common optical axis thereof respectively nearer to and farther from the

record medium, with each movement between the two end positions occurring over corresponding equal periods of time; and

performing, upon a focusing operation after start up of focus control, ~~the~~ a positional adjustment of said at least one of said first lens and said second lens to adjust the distance there between after start up of focus control[[,]] on the basis of changes in the reproducing signals obtained ~~from said recording medium~~ at one or more points of the cyclic movement positions of said at least one of said first lens and said second lens during the repeatedly moving step[[,]] ~~wherein a cycle of the cyclic change in a distance between said first lens and second lens is longer than a cycle of the cyclic movement of said at least one of said first lens and said second lens.~~

23. (Currently Amended) An optical information recording/reproducing method according to claim 22, ~~wherein~~ a cycle of the cyclic further comprising a step of synchronizing the repeated movement of said at least one of said first lens and said second lens is synchronized with an appearance cycle of pit signal portions which are previously[[,]] in the reproducing signal caused by pits discretely formed on said recording medium.

24. (Currently Amended) An optical information recording/reproducing method according to claim 22, wherein the ~~positional adjustment of said at least one of said first lens and said second lens is based on~~ changes in the reproducing signals are changes in an envelope component of the reproducing signal detected by said optical pickup thereof.

25. (Canceled)

26. (Currently Amended) An optical information recording/reproducing method according to claim 22, wherein said ~~step of performing the positional adjustment of said first lens and said second lens comprises the step of:~~

~~performing, upon focusing operation, the positional adjustment of said first lens and said second lens after start up of focus control, on the basis of reproducing signals from said recording medium at both ends of the cyclic movement of said at least one of said first lens and said second lens~~ one or more positions are two positions corresponding to said two end positions.

27. (Currently Amended) An optical information recording/reproducing method according to claim [[22]] 24, wherein further comprising passing the received reproducing signals through a low band filter so as to provide the envelope component is a signal component of the reproducing signals detected by the optical pickup passed through a low band filter.

28. (Currently Amended) An optical information recording/reproducing method according to claim [[22]] 24, wherein further comprising passing the received reproducing signals through a high band filter so as to provide the envelope component is a signal component of the reproducing signals detected by the optical pickup passed through a high band filter.